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EXAMINER

DOVE, J

ART UNIT

PAPER NUMBER

1753

6

DATE MAILED:

07/12/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/331,729

Applicant(s)

OSAN et al

Examiner

J. DOTE

Group Art Unit

1753

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- ☒ Responsive to communication(s) filed on 8/26/99
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-14 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-14 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☒ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) _____.
- ☒ received in this national stage application from the International Bureau (PCT Rule 1.7.2(a)).

*Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____ ☐ Interview Summary, PTO-413
- ☒ Notice of Reference(s) Cited, PTO-892 ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948 ☐ Other _____

Office Action Summary

1. The examiner acknowledges the amendments to claims 3, 5, 6, 8, 10, and 12, set forth in Paper No. 5 filed Aug. 26, 1999.

Claims 1-14 are pending.

2. The disclosure is objected to because of the following informalities:

1) The specification, at page 4, lines 22-23, discloses a polyolefin resin having a cyclic structure having a heat distortion temperature (HDT) by the DIN53461-B method of 70°C or higher. However, the specification does not define the standard DIN53461-B, nor the experimental conditions under which the HDT is determined. Furthermore, the specification does not disclose the date of the particular version of the standard that was used.

2) The specification at page 15, lines 5-6, discloses that a flowing agent such as colloid silica can be added to the toner. The specification at page 16, lines 10 and 24, and at page 17, line 8, discloses the use of "aerosol silica (HDK-HD200, Wacker Chemical)" in the various exemplified toner formulations. It is not clear what is meant by "aerosol silica." Aerosol is defined as "a suspension of colloidal particles in a gas." See Webster's New World Dictionary, Third College Edition (1988), page 21. Is "aerosol silica" another name for colloidal silica?

3) The specification discloses liquid toners and liquid dried systems that comprise an electrolytic solution. See Toner

preparation methods 4 and 5 at page 17. However, the specification identifies ISOPAR H as an electrolytic solution. ISOPAR H is known to be a non-polar hydrocarbon (i.e., isoparaffinic) liquid. See US 5,019,477, col. 6, lines 27-37. Hydrocarbon liquids are not electrolytic. Thus, it is not clear what applicants mean by the term "electrolytic solution."

4) Table 1 discloses that the toner Examples 1-8 and Comparative Examples 1-3 are made by Toner preparation methods 1 and 3, and that Examples 20-30 and Comparative Examples 5 and 6 are made by Toner preparation methods 4 and 5. It is not clear how the examples are made by both methods 1 and 3, or by methods 4 and 5. Method 1 is not the same as method 3, nor is method 4 the same as method 5.

Appropriate correction is required.

3. The use of the trademarks at pages 8, 16, 17, and 21, of the specification, e.g., PERMANENT RUBIN F6B at page 8, line 26, has been noted in this application. They should be capitalized wherever they appear and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

4. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

1) In claim 3, the recitation "polyolefin resin having a cyclic structure has at least one polar functional group" lacks antecedent basis in the specification. Compare the specification at page 12, lines 5-12, and page 13, lines 1-2, which disclose a polyolefin having a cyclic structure can have carboxyl, hydroxyl, or amino groups. The recitation "polar functional group" encompasses other non-disclosed polar groups, e.g., cyano groups, besides the disclosed carboxyl, hydroxyl, and amino groups.

2) In claim 7, the recitation "crosslinked by . . . ester, amide, sulfide or ether" lacks antecedent basis in the specification. Compare the specification at page 13, lines 10-32, which discloses that a polyolefin having a cyclic structure can be crosslinked by the addition of a crosslinking agent, oxidation, or epoxidation. The specification further discloses that a polyolefin having a cyclic structure which has a carboxyl group can be crosslinked by the addition of a metal.

3) In claim 7, if the term "a diene," in the phrase "polyolefin resin having a cyclic structure has a structure crosslinked by a diene" refers to another compound, i.e., a diene

crosslinking compound that is not part of the polymer, the phrase lacks antecedent basis in the specification. Compare the specification at page 13, lines 5-10, which discloses that the polyolefin resin having a cyclic structure copolymerized with a diene monomer such as norbornadiene or cyclohexadiene can have a crosslinked structure.

4) The entire recitation of claim 13 lacks antecedent basis in the specification.

5) The entire recitation of claim 14 lacks antecedent basis in the specification.

5. The instant specification, at page 16, lines 3-4, discloses that the intrinsic viscosity of the polyolefin resin having a cyclic structure is measured at 135°C for 1 g of resin uniformly dissolved in 100 ml of decalin.

The term "liquid dried system" recited in claim 13 is interpreted to refer to a liquid toner that comprises an electrolytic solution and toner particles that are obtained by a dry polymerization method, which forms toner particles by interfacial polymerization. See Toner preparation method 4 in the instant specification at page 17. If applicants do not agreed with the above definition, they should so clearly state and indicate where in the specification there is antecedent basis for their definition.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 and claims dependent thereon are indefinite in the phrase "in said polyolefin resin having a cyclic structure, a resin or resin fraction having an intrinsic viscosity (i.v.) of 0.25 dl/g or more, and a number average molecular weight (Mn) of 7,500 or more and a weight average molecular weight of 15,000 or more . . . is contained in a proportion of less than 50% by weight based on the entire binder resin" because it is not clear whether "a resin or resin fraction having an intrinsic viscosity of 0.25 dl/g or more. . ." refers to the second recited resin or resin fraction having a number average molecular weight of 7,500 or more, or is necessarily another polyolefin having a cyclic structure.

Claim 2 is indefinite in the phrase "other resin comprising one of a polyester resin, epoxy resin . . . styrene-acrylate resin, and other acrylate resin, a mixture, hybrid polymers or

blends of any of them" (emphasis added) because it is not clear whether the claim requires that the other resin comprises all the recited specified resins or just one.

Claim 3 is indefinite in the phrase "functional group selected from a carboxyl group, a hydroxyl group and an amino group" (emphasis added) for improper Markush language. Proper Markush language is "R is selected from the group consisting of . . . and . . . " or "R is . . . or . . . " MPEP 2173.05(h). Applicants are using a combination of both phrases. Hence, it is not clear what is the scope of the instant claims.

Claim 7 is indefinite in the phrase "said polyolefin resin having a cyclic structure has a structure crosslinked by a diene . . . " because it is not clear whether the "diene" is part of the polyolefin or is a separate compound.

Claim 13 is indefinite in the phrase "aerosol silica" for the reasons given in item 2 of paragraph 2 above.

Claims 13 and 14 are indefinite in the phrase "electrolytic solution" for the reasons given in item 3 of paragraph 2 above.

8. The term "polyolefin resin or resin fraction having a cyclic structure" that has the recited intrinsic viscosity and molecular weights recited in claim 1 is interpreted by the examiner to refer to the previously recited resin or resin fraction having a number average molecular weight of 7,500 or more. The recitation

that the polyolefin resin or resin fraction having a number average molecular weight of 7,500 or more "is contained in a proportion of less than 50 % by weight based on the entire binder resin" reads on "zero weight percent." In other words, the recited polyolefin need not be present in the toner. This reading is consistent with the "inventive" examples of the specification. Examples 1, 3-7, 9, 11-18, 20, and 22-29, which are labeled "inventive," comprise toners that contain only one polyolefin having a cyclic structure; however, these polyolefins have a number average molecular weight of less than 7,500, and do not have the intrinsic viscosity and weight average molecular weight recited in instant claim 1. Rejections made in view of this reading of claim 1 follow.

The term "electrolytic solution" recited in claims 13 and 14 appears to be disclosed by the instant specification to include hydrocarbon liquids, such as ISOPAR H. Thus, the rejections set forth in paragraphs 12, 14, and 15, infra, are made in view of applicants' definition of "electrolytic solution."

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1-9 and 12 are rejected under 35 U.S.C. 102(a) as being anticipated by WO 97/05529 (WO'529), as further evidenced by CAPLUS abstract AN 1994:459376 of JP 06032917. WO'529 and the instant application have common inventors. US application 09/000,300 (US'300), filed under 35 U.S.C. 371 on May 20, 1998, is the national application of WO'529, and the English-language translation of WO'529.

WO'529 discloses toners that meet the limitations of the instant claims. The toners comprise a binder resin, charge control agent, a colorant, and a functional imparting agent, such as HOECHST WAX E. See Toner preparation method I at page 6, and Examples 1-7 of Table 2-1 at page 7. HOECHST WAX E is identified as a condensate of ethylene glycol with a higher aliphatic acid,

which is within the scope of instant claim 9. See the CAPLUS abstract. The binder resins in Examples 1-7 are as follows:

Example 1 - polyolefin having a cyclic structure, T745, which has a Mn of 3800. See Table 3 at page 9. The binder resin meets the limitations of claims 1 and 12.

Example 2 - a mixture of polyolefin T745 and polyolefin having a cyclic structure S-8007, which has a Mn of 35,000, Mw of 70,000, and i.v. of 0.8, in an amount of 33% by weight of the entire binder resin. See Table 3. The binder resin meets the limitations of claim 1.

Example 3 - polyolefin T745 and a polyester resin TAFTON NE21555. See Table 3. The binder resin meets the limitations of claim 2.

Example 4 - polyolefin having a cyclic structure T-745-MO, which has a Mn of 3400. See Table 3. T-745-MO is identified by the instant application at page 21 as the reaction product of T-745, a copolymer of ethylene and norbornene, with a peroxide and 7% by weight, based on T-745, of maleic anhydride, which introduces carboxyl groups. The binder resin meets the limitations of claims 3 and 4.

Example 5 - mixture of polyolefin T-745-MO and polyester TAFTON NE21555. The binder resin meets the limitations of claims 2-4.

Example 6 - polyolefin having a cyclic structure T-745-CL, which has a Mn of 3400. T-745-CL is identified by the instant application at page 21 as an ionomer, which is obtained by neutralizing about 70% of the carboxyl groups of T-745-MO with zinc. The instant specification at page 13, lines 16-31, discloses that such an ionomer is a crosslinked structure. The binder resin meets the limitations of claims 5-7.

Example 7 - mixture of polyolefin T-745-CL and polyester TAFTON NE21555. The binder resin meets the limitations of claims 2 and 5-7.

12. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO'529.

WO'529 discloses a liquid toner that comprises 60 wt% of an "electrolytic solution," ISOPAR H, and 40 wt% of a mixture comprising 1 part by weight of carbon black, 0.5 part by weight of a charge control agent, and 98.5 parts by weight of a binder resin. See Toner preparation method III at page 7, and Examples 18-27 in Table 2 at page 8. The above liquid toner meets the limitations of instant claim 14, except for the amount of binder resin. However, WO'529 discloses that liquid toners can comprise 15 to 50 wt% of binder resin, 0-10 wt% of colorant, 0-5 wt% of a charge control agent, 0-10 wt% of a functioning agent, such as a wax, and 50 to 70 wt% of an electrolytic solution, based on the

total weight of the liquid toner. See Table 2 at page 2, and page 6, lines 5-9. The amount of binder resin is a rate-resultant variable, variation of which is within the skill of the ordinary worker in the art.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of WO'529, to vary the amount of the binder resin, through routine experimentation, in the liquid toner disclosed by WO'529, such that the amount would be within the range of 85 to 95 wt% recited in instant claim 14, because that person would have had a reasonable expectation of successfully obtaining a liquid toner having the properties disclosed by WO'529. See the abstract of WO'529.

13. Claim 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO'529 combined with US 5,707,772 (Akimoto).

WO'529 discloses toners which are described in paragraph 11 above, which are incorporated herein by reference. WO'529 discloses that the toners can comprise a function imparting agent. See page 6, lines 5-9.

WO'529 does not disclose that the function imparting agent is a non-polar polyolefin wax as recited in the instant claims. However, WO'529 does not limit the type of function imparting agent used. WO'529 prefers that the function imparting agent be a wax that has a melting point of 60 to 170°C. Page 6,

lines 5-9. Akimoto teaches low molecular weight polyolefin waxes that have a melting point between 70 and 150°C. Col. 8, line 66, to col. 9, line 5; and Releasing agents 1 to 4 in Table 1 at col. 12. The polyolefin waxes are synthesized in the presence of a metallocene catalyst. Col. 11, lines 52-67. Akimoto discloses that toners that comprise said polyolefin waxes as releasing agents provide excellent images with excellent storage stability, little off-set, and "slight winding phenomena." See Toners 1 through 7 in Tables 2 and 3, and col. 16, lines 17-18.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Akimoto, to use the low molecular weight polyolefin of Akimoto as the function imparting agent in the toners disclosed by WO'529, because that person would have had a reasonable expectation of successfully obtaining toners having the advantages disclosed by Akimoto discussed above.

14. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,923,778 (Blair), as further evidenced by US 5,019,477 (Felder).

Blair discloses a liquid developer that comprises toner particles and a liquid hydrocarbon in an amount of 50 to 78 wt% based on the total weight of the liquid developer. The total weight of the developer solids, i.e., toner particles, of the

liquid developer is 22 to 50 wt%. Col. 4, lines 13-21. Blair exemplifies a liquid developer comprising 70 wt% of a liquid hydrocarbon. See Example 1. The toner particles comprise 80 wt% of a resin binder, 18.6 % of carbon black, and 5 wt% of the charge adjuvant aluminum stearate. See Example 1 at col. 9. (Felder identifies aluminum stearate as a negative charge adjuvant. Col. 8, lines 41-46.)

The amount of carbon black is not within the range of 0.5 to 1.5 wt% as recited in claim 14. However, Blair teaches that the amount of colorant can vary from 0.1 to 30 wt% based on the weight of the toner particles. Col. 5, lines 45-47. Since the amount of carbon black determines the image density of the toner image, the amount is a rate-resultant variable, the variation of which is within the skill of the ordinary worker in the art.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Blair, to vary the amount of carbon black, through routine experimentation, in the liquid toner disclosed by Blair, such that the amount would be within the range of 0.5 to 1.5 wt% recited in instant claim 14, because that person would have had a reasonable expectation of successfully obtaining a liquid toner that provides the desired image density.

15. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,843,613 (Fujiwara), as further evidenced by ACS File Registry No. RN 64365-06-6, combined with Felder and US 4,659,640 (Santilli).

Fujiwara discloses a liquid developer that comprises negatively charged toner particles and a liquid hydrocarbon carrier, IP SOLVENT 1620, which comprises a basic dispersion resin. Col. 2, lines 54-56; col. 7, lines 11-27, and Example 27. (IP SOLVENT 1620 is identified as an isoparaffin liquid. See the File Registry No. RN 64365-06-6.) The toner particles comprise 82 wt% of a polyester binder resin, 16.4 wt% of carbon black, and 1.6 wt% of silica. See Example 27. Fujiwara discloses that such a liquid toner has excellent charging characteristics, and provides toner images that have excellent image density and resolution. Col. 2, lines 1-16, and Example 27 in Table 2 at col. 20.

The exemplified amounts of binder resin and carbon black, and concentration of toner particles are not within the ranges recited in claim 13. However, Fujiwara discloses that the concentration of the toner particles relative to the liquid carrier can vary from 0.5 to 50 wt% from the perspectives of developing speed, image fog, and the like. Col. 7, lines 28-35. Fujiwara's toner particle concentration overlaps the toner particle concentration range of 30 to 50 wt% recited in instant

claim 13. Fujiwara further discloses that the amount of carbon black is typically in the range of 3 to 30 parts by weight relative to 100 parts by weight of resin binder. Col. 4, lines 46-48. Said typical amount of carbon black overlaps the instantly recited range of 1 to 10 wt%. The weight percentage of binder resin will vary with the amount of carbon black. The amount of carbon black determines the image density of the toner image. The concentration of the toner particles in the liquid developer determines the developing speed and image fog. Thus, the amount of carbon black and the concentration of the toner particles are rate-resultant variables, variation of which are within the skill of the ordinary worker in the art.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Fujiwara, to vary the amount of carbon black and the binder resin, and the concentration of the toner particles, through routine experimentation, in the liquid toner disclosed by Fujiwara, such that the amounts of the components would be within the ranges recited in instant claim 13, because that person would have had a reasonable expectation of successfully obtaining a liquid toner having the benefits disclosed by Fujiwara above.

Fujiwara does not disclose that the toner particles further comprise a wax and a charge control agent as recited in claim 13. However, Fujiwara discloses that the toner particles can comprise

various types of additive agents necessary in resin microparticles. Col. 3, lines 51-53.

Felder discloses that a negative charge adjuvant, such as a metallic soap, can be dispersed in the toner particles to increase the negative charge of the toner particles. Col. 8, lines 43-45 and 53-54. Felder discloses that increasing the toner charge increases the mobility and transfer latitude of the toner particles. Col. 8, lines 41-43. Felder discloses that increased mobility and toner charge yield satisfactory toner images. See Tables I and II. Felder discloses that the negative charge adjuvant can be added in an amount of about 1 mg/g to about 100 mg/g of toner particles (0.1 to 10 wt%). Col. 8, lines 46-47, 53-54, and 56-60.

It would have been obvious to a person having ordinary skill in the art, in view of the teachings of Felder, to add a negative charge adjuvant in an amount that is within the scope of the instant claim to the liquid toner rendered obvious over the teachings of Fujiwara, because that person would have had a reasonable expectation of successfully obtaining a liquid toner wherein the toner particles have increased mobility and transfer latitude, thereby proving satisfactory toner images.

Santilli teaches that a liquid toner can comprise toner particles that comprise a wax in combination with a polyester binder resin. Col. 2, lines 2-6. Santilli discloses that the

liquid developer self-fixes to smooth surfaces at room temperature. Col. 1, lines 7-11. In order for the liquid developer to be self-fixing, Santilli discloses that the wax is present in a concentration to provide self-fixing (i.e., above 0.25 part by weight of the binder resin). However, Santilli further discloses that the wax can be present at a somewhat lower concentration so long as the amount provides a self-fixing developer. Col. 2, lines 11-18. Santilli discloses that the skilled artisan will appreciate that some routine effort may be necessary to establish to the amount of a specific wax at which self-fixing commences. Col. 3, lines 55-58. Santilli shows that a liquid developer, which comprises toner particles comprising 1 part by weight of a polyester binder resin and carnauba wax in a concentration of 0.125 part by weight, is self-fixing. See Table 1, example 10.

It would have been obvious to a person having ordinary skill in the art, in view of the teachings of Santilli, to add a wax, and to vary the amount of the wax, through routine experimentation, such that the amount is within the range recited in instant claim 13, to the liquid toner rendered obvious over the combined teachings of Fujiwara and Felder, because that person would have had a reasonable expectation of successfully obtaining a liquid toner that is self-fixing as defined by Santilli.

Instant claim 13 recites "a dried polymerized system." In other words, the toner particles are made by a dried polymerization method. This claim is written in product-by-process format. The toner particles in the liquid toner exemplified in Example 27 of Fujiwara are not made by the dried polymerization method recited in the instant claims. However, Fujiwara discloses that his toner particles can also be obtained by conventional emulsion polymerization methods. Col. 3, lines 54-55 and 58. Hence, since the toner particles rendered obvious over the combined teachings of Fujiwara, Felder, and Santilli meet the compositional limitations of the instant claims, and are used for the same purpose as applicants, as toner particles in a liquid toner, it appears that toner particles rendered obvious over the cited prior art are the same or substantially the same as those made by the process recited in the instant claim. The burden is on applicant to prove otherwise. In re Marosi, 218 USPQ 289 (Fed. Cir. 1983); In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985); MPEP 2113.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (703) 308-3625.

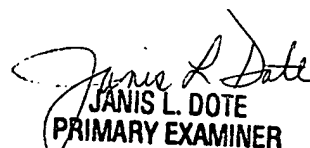
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Nam Nguyen, can be reached on (703) 308-3322. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3599 for after final faxes, and (703) 305-7718 for other official faxes.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

JLD
July 10, 2000


JANIS L. DOTE
PRIMARY EXAMINER
GROUP 1500
1700